

IN THE CLAIMS:

1. [Currently amended] A waste energy recovery assembly, comprising:
- a first plate having first flow channels defined at one side thereof, said first flow channels of said first plate being orientated in a first direction, said first plate having a first supply opening and an first exhaust opening therein, said first supply and first exhaust openings of said first plate positioned for communicating with said first flow channels of said first plate, said first flow channels configured to allow flow of both anode supply and cathode supply across said first plate to a fuel cell; and
- a second plate having second flow channels defined at one side of said second plate, said second flow channels of said second plate being orientated in a second direction different from said first direction, said second plate having a second supply opening and an second exhaust opening positioned for communicating with said second flow channels of said second plate ~~therein,~~ said second flow channels supply opening of said second plate configured to allow flow of both anode exhaust and cathode exhaust across said second plate from said fuel cell positioned for communicating with said flow channels of said second plate, said second plate being disposed in thermal communication with said first plate heating said flow of both said anode supply and said cathode supply via said flow of both anode exhaust and cathode exhaust having a higher temperature with said supply opening of said second plate aligning with said supply opening of said first plate and with said exhaust opening of said second plate aligning with said exhaust opening of said first plate.

2. [Original] The waste energy recovery assembly of Claim 1 wherein said flow channels in each of said first plate and said second plate are defined by etchings in said first plate and etchings in said second plate.

3. [Original] The waste energy recovery assembly of Claim 2 wherein said etchings are shaped to induce a swirl into a flow.

4. [Original] The waste energy recovery assembly of Claim 2 wherein said etchings form a geometric pattern.

5. [Original] The waste energy recovery assembly of Claim 4 wherein said geometric patterns include an S-shape pattern, a serpentine pattern, a chevron pattern, or a wave-form pattern.

6. [Original] The waste energy recovery assembly of Claim 1 wherein said first direction is perpendicular to said second direction.

7. [Currently amended] The waste energy recovery assembly of Claim 18 wherein said first supply opening in each of said first plate and said second plate comprises an anode supply opening and a cathode supply opening.

8. [Currently amended] The waste energy recovery assembly of Claim 7 wherein:

said flow channels in said second plate includes anode ~~exhaust~~ supply flow channels and cathode ~~exhaust~~ supply flow channels;

said anode supply opening comprises an anode supply opening in and an anode supply opening out positioned for communication with said anode supply flow channels; and

said cathode supply opening comprises a cathode supply opening in and a cathode supply opening out positioned for communication with said cathode supply flow channels.

9. [Currently amended] The waste energy recovery assembly of Claim 8 wherein said first ~~second~~ plate further includes:

a rib separating said anode supply flow channels from said cathode supply flow channels.

10. [Original] The waste energy recovery assembly of Claim 1 wherein said first direction is different than said second direction.

11. [Original] A method of waste energy recovery, comprising:
communicating an exhaust received at an exhaust opening in a first plate through exhaust flow channels defined at one side of said first plate to an exhaust opening out of said first plate, said exhaust flow channels being orientated in a first direction;
communicating an oxidant received at an anode supply opening in a second plate through anode supply flow channels defined at one side of said second plate to an anode supply opening out of said second plate, said anode supply flow channels being orientated in a second direction, said second plate being disposed in thermal communication with said first plate;
communicating a reformat received at a cathode supply opening in said second plate through cathode supply flow channels defined at said one side of said second plate to an anode supply opening out of said second plate, said cathode supply flow channels being orientated in said second direction; and
whereby said oxidant and said reformat are heated.

12. [Original] The method of Claim 11 wherein said exhaust flow channels are defined by etchings in said first plate, and said anode supply flow channels and said cathode supply flow channels are defined by etchings in said second plate.

13. [Original] The method of Claim 11 wherein said first direction is different than said second direction.

14. [Original] The method of Claim 11 wherein said first direction is perpendicular to said second direction.

15. [Original] The method of Claim 12 further comprising:

inducing a swirl into at least one of said exhaust, said oxidant, or said reformat.

16. [Newly Added] The waste energy recovery assembly of Claim 1 wherein said flow of anode supply is segregated from said flow of cathode supply across said first plate to a fuel cell via a first rib extending across said first plate in said first direction.

17. [Newly Added] The waste energy recovery assembly of Claim 1 wherein said flow of anode exhaust is segregated from said flow of cathode exhaust across said second plate from said fuel cell via a second rib extending across said second plate in said second direction.

18. [Newly Added] The waste energy recovery assembly of Claim 1 wherein said first supply and first exhaust openings of said first plate are at least one of aligned with and in fluid communication with corresponding first supply and first exhaust openings disposed in said second plate, and said second supply and second exhaust openings of said second plate are at least one of aligned with and in fluid communication with corresponding second supply and second exhaust openings disposed in said first plate.